

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference E29 P151PCT		FOR FURTHER ACTION See Form PCT/IPEA/416																									
International application No. PCT/SE2004/001248	International filing date (day/month/year) 31-08-2004	Priority date (day/month/year) 16-10-2003																									
International Patent Classification (IPC) or national classification and IPC See Supplemental Box																											
Applicant Telefonaktiebolaget LM Ericsson (publ) ET AL																											
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>4</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>7</u> sheets, as follows:</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>																											
<p>4. This report contains indications relating to the following items:</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>				<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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Date of submission of the demand 11-05-2005		Date of completion of this report 07-02-2006																									
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88		Authorized officer Lisbeth Andersson / ITW Telephone No. +46 8 782 25 00																									

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/PCT/SE2004/001248

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: **Cover sheet**

INTERNATIONAL PATENT CLASSIFICATION (IPC):

H04L 12/28 (2006.01)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE2004/001248

Box No. I Basis of the report

1. With regard to the language, this report is based on:

- ☐ the international application in the language in which it was filed
- ☐ a translation of the international application into _____
which is the language of a translation furnished for the purposes of:
- ☐ international search (Rules 12.3(a) and 23.1(b))
- ☐ publication of the international application (Rule 12.4(a))
- ☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

☐ the international application as originally filed/furnished

☒ the description:

pages 1 - 41

pages* _____ as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☒ the claims:

pages _____

pages* _____ as originally filed/furnished

pages* _____ as amended (together with any statement) under Article 19

pages* 1 - 7 received by this Authority on 22-11-2005

pages* _____ received by this Authority on _____

☒ the drawings:

pages 1 - 14

pages* _____ as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE2004/001248

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-26</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-26</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-26</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

This report is based on the amended claims 1-26 received by this authority on 22-11-2005.

Documents cited in the International Search Report:

D1: WO 02063900 A1

D2: SALKINTZIS, A K: Interworking between WLANs and third-generation cellular data networks. 57th IEEE Semiannual Vehicular Techn Conf. VTC 2003, Jeju, South Korea, 22-25 April 2003. Conf Art, Publ 2003, Piscataway, NJ, USA, pages 1802-1806, vol 3. AN 7921906, ISBN 0-7803-7757-5.

D3: VARMA, V K et al: Mobility management in integrated UMTS/WLAN networks. 2003 IEEE Int Conf on Communications, Anchorage, AK, USA, 11-15 May 2003. Publ 2003, Piscataway, NJ, USA. Conf Art, pages 1048-1053, vol 2. AN 7905811, ISBN 0-7803-7802-4.

D4: EP 1207708 A1

D5: WO 0041375 A1

The cited documents represent the general state of the art. The invention defined in claims 1-26 is not disclosed by any of these documents. The cited prior art does not give any indication that would lead a person skilled in the art to the claimed arrangement and method for providing user stations with access to service providing networks. Therefore, the claimed invention is not obvious to a person skilled in the art.

Accordingly, the invention defined in claims 1-26 is novel and is considered to involve an inventive step. The invention is industrially applicable.

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E29 P151PCT AB/ej 2005-11-21

CLAIMS

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1. An arrangement for providing a user station with access to
(a) service providing network(s) over a wireless radio access
network,

c h a r a c t e r i z e d i n

10 that it comprises a radio access network control node (RANCN; 3)
acting as a gateway node between access stations (AP; HBS;
2A,2B;4) and the service providing network(s), and in that it
comprises connection processing means for adapting service
15 providing network transport protocols, converting/mapping
service network access bearers into transport protocol packets
of the wireless radio access network, such that the user station
(1A,1B;1) can access the service providing network services over
the radio interface of the wireless radio access network, that
the radio access network support node (RANCN; 3) reuses a set of
20 service network transport protocols for communication over the
radio access network, the reused protocols being tunneled using
the Internet Protocol (IP) through an access station (AP; HBS;
2A,2B;4) connected to the radio access network control node
(RANCN; 3), said set of service network transport protocols
25 being the 3GPP RRC and RLC/MAC protocols modified to provide
access to the service providing network comprising a 3G, e.g.
UMTS, GPRS, WCDMA, core network via an Iu-interface.

2. An arrangement according to claim 1,

30 c h a r a c t e r i z e d i n

that the reused protocol stacks are reused transparently over the
radio access network air interface.

3. An arrangement at least according to claim 1,
c h a r a c t e r i z e d i n
that it supports multiple access bearer connections of different
bit rates, types, bandwidth and/or QoS.

5

4. An arrangement according to claim 3,
c h a r a c t e r i z e d i n
that it is capable of establishing one or more access bearers
simultaneously wherein the access bearers are configured for
10 different types of media services.

5. An arrangement according to claim 4,
c h a r a c t e r i z e d i n
that the access bearer(s) carry(ies) connections for a plurality
15 of services of its associated type(s).

6. An arrangement at least according to claim 1,
c h a r a c t e r i z e d i n
that the various services provided over access bearers comprise
20 circuit switched as well as packet switched bearers.

7. An arrangement according to any one of the preceding
claims,
c h a r a c t e r i z e d i n
25 that the service providing network is a 3G network, a BRAS IP
services provider network, a video on demand network or a live
TV network.

8. An arrangement according to claim 7,
30 c h a r a c t e r i z e d i n
that the service providing network is a UMTS/WCDMA or CDMA 2000.

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3

9. An arrangement according to any one of the preceding claims,

c h a r a c t e r i z e d i n

that the over IP reused protocols are W-CDMA L3 RRC, L2 RLC/MAC.

5

10. An arrangement according to any one of the preceding claims,

c h a r a c t e r i z e d i n

10

that with the adapted reused protocols multiple access bearers are set up simultaneously.

11. An arrangement according to any one of the preceding claims,

c h a r a c t e r i z e d i n

15

that it dynamically establishes a number of access bearers to a user station (1A,1B) connected to the arrangement (RANCN).

12. An arrangement according to any one of the preceding claims,

20

c h a r a c t e r i z e d i n

that it provides a user station comprising a user equipment comprising a PC, Laptop, telephone etc. with access to UMTS/CDMA/BRAS/Video on demand/Live TV services over Bluetooth, the access station comprising a Home Base Station (HBS).

25

13. An arrangement according to any one of claims 1-11,

c h a r a c t e r i z e d i n

30

that it provides a user station with the possibility to access UMTS/CDMA/BRAS/Video on demand/Live TV service over the IEEE 802.16a/e, e.g. is a WiMAX or a network using OFDM based radio technology, or a WLAN.

14. An arrangement according to claim 12 or 13,

22-11-2005

4

characterized in

that it controls set-up and release of access bearers by reuse of the RLC/MAC and RRC protocols run over UDP/IP over radio interfaces, e.g. meeting IEEE 802.X requirements, such as Bluetooth, WiMAX, WLAN, between the access station and the user station, and over any transport protocol between RANCN and the access station, e.g. a Bluetooth HBS or a WLAN AP.

15. An arrangement according to any one of the preceding claims,

characterized in

that it comprises a gateway node between access stations (AP:s, HBS:s) of the wireless radio access network, e.g. Bluetooth, WiMAX, WLAN and the Iu-interface of UMTS, an access station (AP, HBS) (2A,2B;4) relaying RRC, RLC/MAC over any transport protocol used between the access station (2A,2B;4) and the (RANCN; 3).

16. An arrangement according to claim 12,

characterized in

that UDP/IP and the Bluetooth or WLAN radio interface is used for RRC/RLC/MAC between service network and RANCN (3), and RANCN (3) and user station (1A,1B) respectively.

17. An arrangement according to any one of claims 1-16,

characterized in

that storing means are provided in a radio access network control node (RANCN 3) for collecting, holding and sorting identity related information of user stations, and in that for user stations currently being in an area or a location fulfilling some given criteria, or e.g. being in a similar environment as far as service offering or tariff setting is concerned, information thereon is distributed to such mobile user stations having indicated that they want information about

each other and that they allow information to be distributed to one another.

18. An arrangement according to claim 17,

5 c h a r a c t e r i z e d i n

that several RANCN:s exchange identity related information about user stations currently in areas or locations in which certain criteria are met, e.g. in areas or locations with similar properties, e.g. as far as charging is concerned.

19. A method for providing a user station with access to services of a service providing network over a wireless radio access network,

c h a r a c t e r i z e d i n

15 that it comprises the steps of:

- establishing a connection between the user station and an access station over the wireless radio access network;
- initiating/establishing an IP session between the user station and a radio access network control node (RANCN);
- 20 - adapting control and user plane transport protocols, comprising the 3GPP L2 RLC/MAC and L3 RRC protocols, of the service providing network to transport protocols of the wireless radio access network to provide access to the service providing network comprising a 3GPP core network
- 25 e.g. UMTS, GPRS, WCDMA via the Iu-interface comprising converting/mapping service network access bearers into transport packets of the wireless radio access network,
- using the adapted 3GPP network transport protocols over the radio interface of the wireless radio access network.

20. A method according to claim 19,

c h a r a c t e r i z e d i n

that the adapted and reused transport protocols of the service providing network are tunneled using the Internet Protocol (IP) through an access station (AP, HBS) connected to the radio access network control node (RANCN).

5

21. A method according to claim 20,
c h a r a c t e r i z e d i n
that it comprises the step of:

- 10 - providing the user station dynamically with access to
various services over circuit and/or packet switched
bearers of variable bandwidth, type and/or QoS.

22. A method according to claim 21,
c h a r a c t e r i z e d i n

15 that it comprises the step of:

- setting up multiple access bearers simultaneously.

23. A method according to any one of claims 19 or 22,
c h a r a c t e r i z e d i n

20 that it comprises the step of:

- 25 - controlling in the RANCN, set-up and release of access
bearers by adapting and reusing the RRC,RLC/MAC and
protocols such that they can run over UDP/IP over the
interface protocol between the user station and the access
station.

24. A method according to any one of claims 19-23,
c h a r a c t e r i z e d i n

that it comprises the step of:

- 30 - dynamically establishing a number of access bearers to the
user station connected to the RANCN.

25. A method according to any one of claims 19-24,

c h a r a c t e r i z e d i n

that the wireless radio access network is Bluetooth, the access station being a Home Base Station (HBS).

5 26. A method according to any one of claims 19-24,

c h a r a c t e r i z e d i n

that the wireless radio access network is WiMAX or a wireless radio access network implementing an OFDM based radio technology or a WLAN.